

Customer No.: 31561
Application No.: 10/064,369
Docket No.: 9113-US-PA

REMARKS

Present Status of the Application

Claims 1-20 remain pending. For at least the following reasons, Applicants respectfully submit that claims 1-20 are in proper condition for allowance. Reconsideration is respectfully requested.

Response to Rejections under 35 U. S. C. 103

The Office Action rejected claims 1-3, 11-13 and 20 under 35 U.S.C. 103(a) as being unpatentable over Allen et al. (US-20020029956, hereinafter Allen).

In rejecting the above claims, the Office Action stated that Allen discloses the method of cleaning wafer similar to claims 1 and 12. Allen discloses a method of using laser to scan/clean different types of particles on a surface of a wafer, to determine if the particles have been removed and if they have any adverse effect on a subsequently formed device by checking the patterns, sizes etc. Allen does not teach or suggest to modify the operating parameters of the actual process operation if the particles have some adverse effects. However it would have been obvious to one skilled in the art that if the particles have some effects, the operating parameters should be modified in order to obtain a better yield, and as high wafer-cleaning efficiency as possible.

Applicants respectfully disagree and traverse the above rejections as follows. Independent claims 1 and 12 are allowable for at least the reason that Allen fails to teach, suggest or disclose every features of the claimed invention as claimed in claims 1 and 12. More specifically, Allen fails to teach, suggest or disclose a method of increasing the wafer-cleaning efficiency comprising the steps of "depositing different types of process"

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particles on a test wafer; conducting a cleaning operation to remove process particles from the test wafer; scanning the test wafer to determine the type of process particles completely removed from the test wafer and the type of process particles retained on the test wafer; producing an assessment of the wafer-cleaning operation according to the results obtained by scanning the test wafer for process particles remaining on the test wafer; and adjusting the operating parameters of the cleaning operation to boost wafer-cleaning efficiency, as required by Claim 1". Instead, Allen substantially teaches [a method using laser energy for cleaning a surface of the wafer]. Further, Allen suggest in paragraph [0062] through paragraph [0070] on page 6 that the various parameters of the laser energy such as wave length, energy density, pulse length, shape and size to optimize the cleaning process using laser energy can be varied in order to modify the cleaning process using the laser energy. However, Allen substantially fails to teach, suggest or disclose a process of optimizing the cleaning process. Further, no where in the Allen patent (neither in the abstract nor the written description) there any description equivalent of showing the step of scanning the test wafer to determine the type of process particles completely removed from the test wafer and the type of process particles retained on the test wafer. In other words, the teachings of Allen cannot possibly lead one skilled in the art to develop a process of increasing the cleaning efficiency including [at least the steps of depositing different types of process particles on a test wafer; conducting a cleaning operation to remove process particles from the test wafer; scanning the test wafer to determine the type of process particles completely removed from the test wafer and the type of process particles retained on the test wafer as required by Claim 1]. Accordingly,

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Applicants respectfully submit that Allen cannot possibly render every features of claim 1 obvious in this regard.

Further, Applicants respectfully submit that the teachings of Allen would best lead one skilled in the art to modify the parameters of the laser energy during every cleaning steps and observe the results to further optimize the conditions of cleaning process in the subsequent wafer. Accordingly, Applicants respectfully submit that Allen cannot possibly render the process as claimed in claim 1 obvious.

Furthermore, Applicants similarly submit that Allen also substantially fails to teach, suggest or disclose a process of increasing the process yield comprising the steps of: depositing different types of process particles on a test wafer; scanning the process particles on the test wafer to simulate the types of process particles produced in an actual processing operation; determining if the process particles have any adverse effect on a subsequently formed device according to the results of the scanning operation; and increasing the process yield of the actual processing operation by modifying the operating parameters of the actual processing operation if the process particles have some adverse effects on the device, as required by Claim 12.

For at least the foregoing reasons, claims 1-20 patently define over Allen. Reconsideration and withdrawal of these rejections is respectfully requested.

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CONCLUSION

For at least the foregoing reasons, it is believed that all pending claims 1-20 are in proper condition for allowance. If the Examiner believes that a conference would be of value in expediting the prosecution of this application, he is cordially invited to telephone the undersigned counsel to arrange for such a conference.

Respectfully submitted

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